

## DETAILED ACTION

### *Status of Application*

Claim 1 has been amended.

Claims 3-13 remain withdrawn.

Claim 14 is new.

Claims 1, 2, and 14 are presented for examination.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**The rejection of claim 2 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, as generally set forth in the Office Action of 09/18/2008, is maintained.** In the instant case claim 2 is indefinite for failing to define all of the parameters of the claim. It describes a system of two equations with four unknown parameters (T1, T2, A and B). The application does not contain any examples to claim 2.

**Applicants argue** the two constants - A and B - are predetermined from the two formulae (2) and (3), by determining optimum firing temperatures for two cerium carbonates different in fluorine content. The term "optimum firing temperature" in claim 2 is a relative term which renders the claim indefinite. The term "optimum" is not

defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. One of skill in the art would not understand what the optimum range encompasses or what is being optimized with regard to the cerium carbonate firing temperature.

**Amended claim 1 is rejected under 35 U.S.C. 112, second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The "previously obtained relationship" is not described with sufficient specificity in the claims or the specification for the same reasons as set forth in the 112, second paragraph rejection of claim 2. One of skill in the art would not accurately be able to determine the relationship between the claimed parameters ( $f$ ,  $t$ ,  $S$ ,  $t_1$ ,  $f_1$ ). The claims contain indefinite and functional or operational language. The method and relationship must be clearly and positively specified.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 1, 2, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchino et al. (Japanese Patent Publication 2003-082333).**

**The rejection of claims**

In regard to claims 1 and 2, Uchino et al. teaches a cerium oxide abrasive material and method of production. A rare-earth (cerium) carbonate is fired at a temperature between 400-800°C [See Paragraphs 0003 and 0044]. The fluorine content is taught in Table 2. A content of 0.02-0.014 wt % is disclosed. This substantially overlaps with range of instant claim 1 (10-500ppm is 0.001%-0.05%).

In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. In *re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In *re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP 2144.05 I.

The Uchino reference does not teach a formula for setting the firing temperature but the temperature ranges 400-800°C and fluorine concentration (of 0.02-0.014 wt %) taught in the Uchino reference are consistent with the teachings of the instant specification and while the reference is silent as to the preferred method of choosing the temperature, one of skill in the art would be motivated to perform firing of the cerium carbonate at the ranges disclosed by Uchino et al. This represents optimization within the prior art conditions through routine experimentation. Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). See MPEP 2144.05 IIA.

**In regard to the amended features of claim 1**, Uchino et al. teach fluorine content, firing temperature, and surface area of the various examples in the Experimental Tables. A relationship exists between the fluorine content and temperature. Firing temperature is generally higher in examples utilizing a material with a smaller fluorine content value and one would be motivated to operate under similar conditions as those disclosed by Uchino to obtain the appropriate abrasive composition.

**In regard to new claim 14**, the Uchino reference teaches firing the rare-earth (cerium) carbonate at a temperature between 400-800°C [See Paragraph 0044]. The prior art ranges encompass the temperatures of new claim 14.

### ***Response to Arguments***

Applicant's arguments filed on 12/18/2008 have been fully considered but they are not persuasive.

Applicants argue figures 1 and 2 show examples of the invention as claimed in claim 2 and points to Figure 1. Applicant contests that with the data illustrated in Figure 1, the formulas in claim 2 can be used to solve for the constant values. It is noted that the features upon which applicant relies (i.e., specific surface area values) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The claims are rejected under 35 U.S.C. 112, second paragraph for being broad and indefinite.

Applicant argues that the raw material for producing the cerium-based abrasive particles in the Uchino reference is not the cerium carbonate of the present invention. Uchino discloses a rare earth carbonate, heated to temperatures in the range of 400-800°C to form a rare earth oxide in Paragraph 0044. Cerium is a rare earth element. Applicants argue the cerium carbonate of the present invention is commercially

available with an impurity content of less than 100 ppm, and not subject to a fluorination treatment. Table 1 of Uchino teaches specimens 1 and 2, with fluorine content within the claimed ranges, and not subjected to a fluorination treatment. The process of obtaining this carbonate precursor does not impart any special characteristics to the process, as claimed. Applicants argue that the fluorine content in the starting rare earth carbonate is 1600 ppm. This is the fluorine content of the material before processing steps (pulverization, slurring, heating) which occur before the roasting step and is not considered the fluorine content of the "cerium carbonate to be fired".

Applicants argue the raw material is not the cerium carbonate to be fired to produce cerium oxide as in the present application. It noted that the features upon which applicant relies (i.e., rare earth oxide content) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicants argue the Uchino reference does not disclose firing cerium carbonate to produce a cerium oxide abrasive at the temperature ranges claimed. Various examples show roasting temperatures within the claimed ranges. See Table 4 or Table 5 (750°C). Generally, differences in temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such a temperature is critical. See MPEP 2144.05 IIA.

***Conclusion***

Claims 1, 2, and 14 are rejected.

No claims are allowed.

**THIS ACTION IS MADE FINAL.**

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **JENNIFER A. SMITH** whose telephone number is (571)270-3599. The examiner can normally be reached on Monday - Friday, 8:30am to 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571)272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.A. LORENZO/  
Supervisory Patent Examiner, Art Unit 1793

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February 24, 2009  
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JS